

Name: _____

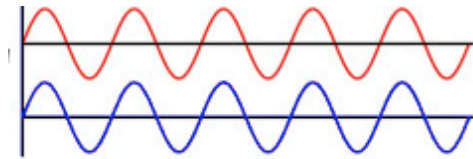
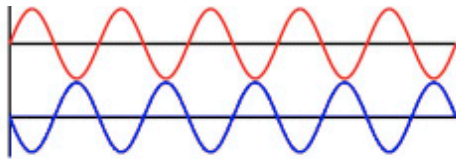
Class Period: _____

Physics: Sound

'Beats', Wave Interference, and Harmonics of a String HW

Conceptual Questions:

1. What is 'beat' frequency? What does it tell you?
2. Which waves will come together constructively and which will come together destructively?



3. If two speakers are playing the same sound, how far apart must they be to experience constructive interference? Destructive interference?
4. A string is vibrating back and forth. Identify the number of the harmonic in the pictures shown below.



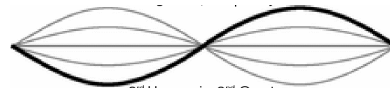
Harmonic: _____



Harmonic: _____



Harmonic: _____



Harmonic: _____

Mathematical Questions

5. A tuning fork with a frequency of 440 Hz is played simultaneously with another fork that plays a frequency of 437 Hz. How many beats will be heard over a period of 10 seconds?

6. The waves traveling on a stretched wire travel with a velocity of 180 m/s when the tension in the wire is 110 N. If the wire has a mass of 0.0056 kg, what is the length?

7. Find the fundamental frequency of a guitar string when the velocity of the string is 115 m/s and the length is 70 **cm**.

8. A 39.0 **cm** length of wire has a mass of 0.006 kg. It is stretched between two fixed supports and under a tension of 175 N.
 - A. What is the velocity of this string?
 - B. What is the fundamental frequency of this wire?
 - C. What is the value of the 5th harmonic based on the fundamental frequency of part B?